Indian Institute of Science

Design of Photovoltaic Systems

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NPTEL Online Certification Course

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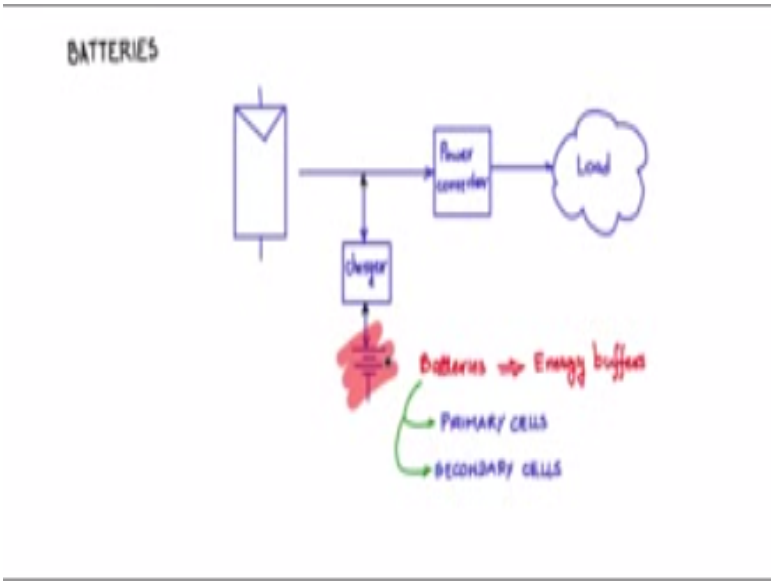

Consider an application like this we have PV panels, PV source which is connected through a power converter and out to our converter is connected to a load. This is a typical application no batteries are used, now there are many applications where the load may demand a very steady power but the power that is coming from the PV is highly fluctuating, we saw that because of the insulation because of varying insulation output power here is fluctuating. So in case the load is demanding a steady power steady power source we need to have an energy buffer somewhere here, so that the PV can charge up this energy buffer energy buffer can supplement the PV source by providing a steady source of power input to the load.

So in general there are many applications, where there is a charger which is again of our electronic converter and charges up a battery or any energy storage device. So assume that this is

a battery and the power can flow into the battery for charging and it can also flow out of the battery while supplementing the PV source when it is weak, so as to make up for the load power requirement. Now this battery is the one of interest and we want to look at some details into the various types of batteries and its characteristics. The battery here is behaving acting like an energy buffer. The batteries are of two main types one is a primary cells and the other type are known as the secondary cells.

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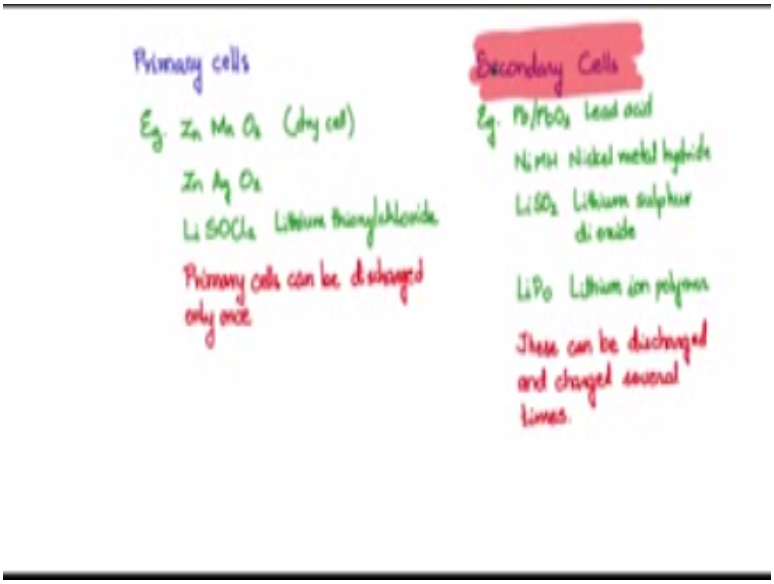

Consider the primary cells the cells that are used for torches clocks remote controls watches they are all primary cells. The main feature of the primary cell is that they can be used for only one discharge, some of the examples are zinc packed manganese oxide also called the dry cell zinc silver oxide lithium terminal, chloride these are some of the primary cells and the most important feature that you should note in a primary cell, is that primary cells can be discharged only once, this is the key feature and after they are discharged once after they are used once you have to throw them away.

Secondary cells on the other hand can be charged and discharged several times, car batteries two-wheeler batteries, UPS batteries these are all examples of secondary cells. So let that X let oxide let R is more commonly called as an acid battery, the acid here is sulfuric acid dilute sulphuric acid nickel metal hydride batteries, lithium sulfur dioxide batteries, lithium-ion polymer

batteries, these are very popular batteries lightweight and are now very popular and almost to be critiques you will find them in almost all the electronic gadgets, cell phones, I Phones, I Pads laptops, camera, video cam, all these devices use these lithium ion polymer batteries.

These batteries as I said mentioned earlier can be charged and charged many times several times. They can be discharged from 100 times to 20,000 times depending upon the type of the battery, so that this is one major advantage of the secondary cells. For photovoltaic based systems most of the applications will use only secondary cells, there will be many several charge discharge cycles and secondary cells are the ones that are most compatible for these applications and we will be discussing these secondary cells their characteristics, their features the parameters and how we go about charging these secondary cells are the ones that we will be discussing in some detail in a short while.